

CLAIMS**I claim:**

1. A fingertip tactile sense input device comprising:
5 an input plate with a plurality of projections, each projection having a front end for receiving pressure contact by a human fingertip, and each projection having a back end;
the projections arranged in a surface area with a generally egg-shaped outline defined by the range of motion on a surface by a human fingertip with the wrist fixed, and that
10 is equally usable with a right or left hand; and
input control means that encodes a given input signal when a respective one of the projections is pressed by a moving fingertip.
2. The fingertip tactile sense input device of claim 1, wherein at least twelve projections
15 are provided within the egg-shaped outline, corresponding to digits 0 - 9 and characters "*" and "#".
3. The fingertip tactile sense input device of claim 2, wherein the at least twelve projections are arrayed in rows and columns, with lateral spacing of the columns in a range of
20 4.5mm to 8.0mm, and vertical spacing of the rows in the range of 4.0mm to 7.0mm.
4. The fingertip tactile sense input device of claim 1, wherein the egg-shaped outline has a height of 24mm to 28mm and a width of 22mm to 28mm.
- 25 5. The fingertip tactile sense input device of claim 1, further comprising:
an electrical input circuit on the back of each projection;
a pressure sensitive variable resistor in each input circuit behind the respective projection;
a selection circuit electrically connected to the input circuits that identifies which one of
30 the projections is being pressed the hardest; and
the input control means is electrically connected to the selection circuit, and encodes a unique electronic representation of each projection identified by the selection circuit.

6. The fingertip tactile sense input device of claim 5, wherein the input plate is flexible, and the projections are integrally molded with the input plate:
7. The fingertip tactile sense input device of claim 5, wherein a given one of the projections is smaller than the other projections to indicate a home position to the tactile sense.
8. The fingertip tactile sense input device of claim 7, further comprising a menu navigation key centered above the projections and two additional function keys equidistant on the left and right from the home position.
9. The fingertip tactile sense input device of claim 5, further comprising:
 - a handheld portable electronic device with a front surface and a back surface;
 - a display screen on the front surface of the portable handheld electronic device;
 - the input plate mounted in the back surface of the portable handheld electronic device;
 - a control section in the handheld portable electronic device that is electrically connected to the input control means and to the display screen;
 - the control section causing the screen to display a visual representation of each projection when it is identified by the selection circuit;
 - the visual representation of the identified projection being displayed in a position on the screen corresponding to the location of the identified projection relative to the other projections.
10. A tactile sense input device comprising:
 - an array of projections protruding from a surface, each projection having a rounded front end for receiving pressure contact from a moving human fingertip, and each projection having a known spatial position relative to the other projections in the array;
 - the projections arranged in an area defined by the range of motion on a surface by a human fingertip with the wrist fixed and equally usable with a right or left hand;
 - an electrical input circuit behind each respective projection;
 - variable resistance means for producing an electric current in each input circuit in proportion to pressure by a human fingertip on the respective projection;

a selection circuit that compares electrical current strengths among the input circuits,
 and identifies the input circuit with the strongest current;
 an input controller, electrically connected to the selection circuit, that encodes a digital
 representation for each input circuit identified by the selection circuit.

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11. The tactile sense input device of claim 10, wherein the array of projections limited to an
 area with a lateral dimension of about 28mm and a vertical dimension of about 30mm.

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12. The fingertip tactile sense input device of claim 10, wherein the input plate is flexible,
 and the projections are integrally molded with the input plate:

13. The tactile sense input device of claim 10, further comprising a navigation key centered
 above the projections and a left and right function key.

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14. The tactile sense input device of claim 10, further comprising:
 a personal digital assistant having an outer case with front and back surfaces;
 a display screen on the front surface of the outer case;
 the plurality of projections being mounted on the back surface of the outer case;
 an input/output control section electrically connected to the input controller and to the
 display screen that causes the screen to display a visual representation of each
 unique digital representation when it is encoded by the input controller;
 each unique visual representation displayed in a position on the screen corresponding to
 the spatial position of the respective projection that caused it.

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15. The tactile sense input device of claim 14, wherein the projections protrude through
 individual holes in the back surface of the outer case of the personal digital assistant.

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16. The tactile sense input device of claim 14, wherein a home position for a fingertip is
 indicated by a surface feature on the back surface of the outer case of the personal digital
 assistance.